TESTING OUTPUTS

Test 1: Implementations work for immediate responses

1.a: One proposer (ImmediateResponseTest1.java)

```
#################################
TEST 1.A: ONE PROPOSER, IMMEDIATE RESPONSE
#################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M1 proposing new proposalID 1 (Attempt 1)
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M8 sending PROMISE for proposal: 1 to proposer: M1
M6 sending PROMISE for proposal: 1 to proposer: M1
M8 sent message: PROMISE 1 M8
M6 sent message: PROMISE 1 M6
M2 sending PROMISE for proposal: 1 to proposer: M1
M3 sending PROMISE for proposal: 1 to proposer: M1
M3 sent message: PROMISE 1 M3
M4 sending PROMISE for proposal: 1 to proposer: M1
M4 sent message: PROMISE 1 M4
M7 sending PROMISE for proposal: 1 to proposer: M1
M7 sent message: PROMISE 1 M7
M9 sending PROMISE for proposal: 1 to proposer: M1
M9 sent message: PROMISE 1 M9
M2 sent message: PROMISE 1 M2
M5 sending PROMISE for proposal: 1 to proposer: M1
M1 recorded PROMISE from M8
M5 sent message: PROMISE 1 M5
M1 recorded PROMISE from M9
M1 recorded PROMISE from M7
M1 recorded PROMISE from M4
M1 recorded PROMISE from M3
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 1 M1
M1 sent message: ACCEPT 1 M1
M1 sent message: ACCEPT 1 M1
M1 sent message: ACCEPT 1 M1
M2 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M3 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M2 sent message: ACCEPTED 1 M2
M3 sent message: ACCEPTED 1 M3
M4 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M5 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M6 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 1 M6
M1 sent message: ACCEPT 1 M1
```

```
M4 sent message: ACCEPTED 1 M4
M1 sent message: ACCEPT 1 M1
M5 sent message: ACCEPTED 1 M5
M1 sent message: ACCEPT 1 M1
M1 sent message: ACCEPT 1 M1
M8 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M7 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M9 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 1 M8
M9 sent message: ACCEPTED 1 M9
M7 sent message: ACCEPTED 1 M7
M1 recorded PROMISE from M2
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 1 M1
M1 sent message: ACCEPT 1 M1
M2 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 1 M1
M3 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M2 sent message: ACCEPTED 1 M2
M3 sent message: ACCEPTED 1 M3
M4 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 1 M4
M1 sent message: ACCEPT 1 M1
M5 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 1 M1
M5 sent message: ACCEPTED 1 M5
M6 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 1 M1
M6 sent message: ACCEPTED 1 M6
M7 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 1 M1
M7 sent message: ACCEPTED 1 M7
M1 sent message: ACCEPT 1 M1
M8 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 1 M8
M9 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M9 sent message: ACCEPTED 1 M9
M1 sent message: FINALISE 1 M1
M1 sent message: FINALISE 1 M1
M1 sent message: FINALISE 1 M1
M1 sent message: FINALISE 1 M1
M2 acknowledged election winner is: 1
M1 sent message: FINALISE 1 M1
M1 sent message: FINALISE 1 M1
M5 acknowledged election winner is: 1
M3 acknowledged election winner is: 1
M4 acknowledged election winner is: 1
M1 sent message: FINALISE 1 M1
M6 acknowledged election winner is: 1
M1 sent message: FINALISE 1 M1

M7 acknowledged election winner is: 1
M8 acknowledged election winner is: 1
M9 acknowledged election winner is: 1
Election winner is M1
RELEASING PORTS
################################
TEST 1.A COMPLETED
```

```
##########################################################
TEST 1.B: TWO CONCURRENT PROPOSERS, IMMEDIATE RESPONSE
##########################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5004
M4 is online on port 5005
M5 is online on port 5006
M6 is online on port 5007
M7 is online on port 5008
M8 is online on port 5009
M9 is online on port 5010
M2 proposing new proposalID 4 (Attempt 1)
M1 proposing new proposalID 2 (Attempt 1)
M2 sent message: PREPARE 4 M2
M1 sent message: PREPARE 2 M1
M2 sent message: PREPARE 4 M2
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M2 sent message: PREPARE 4 M2
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M7 sending PROMISE for proposal: 2 to proposer: M1
M2 sent message: PREPARE 4 M2
M1 sent message: PREPARE 2 M1
M8 sending PROMISE for proposal: 2 to proposer: M1
M3 sending PROMISE for proposal: 4 to proposer: M2
M9 sending PROMISE for proposal: 2 to proposer: M1
M8 sent message: PROMISE 2 M8
M3 sending PROMISE for proposal: 2 to proposer: M1
M3 sent message: PROMISE 2 M3
M2 recorded PROMISE from M3
M6 sending PROMISE for proposal: 2 to proposer: M1
M1 recorded PROMISE from M8
M6 sending PROMISE for proposal: 4 to proposer: M2
M4 sending PROMISE for proposal: 4 to proposer: M2
M1 sent message: PREPARE 2 M1
M2 sent message: PREPARE 4 M2
M7 sending PROMISE for proposal: 4 to proposer: M2
M3 sent message: PROMISE 4 M3
M7 sent message: PROMISE 4 M7
M7 sent message: PROMISE 2 M7
M9 sent message: PROMISE 2 M9
M5 sending PROMISE for proposal: 4 to proposer: M2
M6 sent message: PROMISE 2 M6
M1 recorded PROMISE from M3
M6 sent message: PROMISE 4 M6
M4 sent message: PROMISE 4 M4
M2 recorded PROMISE from M6
M2 sent message: PREPARE 4 M2
M8 sending PROMISE for proposal: 4 to proposer: M2
M9 sending PROMISE for proposal: 4 to proposer: M2
M8 sent message: PROMISE 4 M8
M9 sent message: PROMISE 4 M9
M5 sent message: PROMISE 4 M5
M1 recorded PROMISE from M6
M2 recorded PROMISE from M5
M2 sent message: PREPARE 4 M2
M1 recorded PROMISE from M7
M2 recorded PROMISE from M7
M1 recorded PROMISE from M9
M2 recorded PROMISE from M4
M2 received majority PROMISES, broadcasting ACCEPT.
```

```
M1 received majority PROMISES, broadcasting ACCEPT.
M2 sent message: ACCEPT 4 M2
M2 sent message: ACCEPT 4 M2
M1 sent message: ACCEPT 2 M1
M2 sent message: ACCEPT 4 M2
M2 sent message: ACCEPT 4 M2
M4 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M3 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M1 sent message: ACCEPT 2 M1
M4 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M4 sent message: ACCEPTED 2 M4
M3 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 4 M4
M6 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M5 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M2 sent message: ACCEPT 4 M2
M5 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M7 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M3 sent message: ACCEPTED 4 M3
M1 sent message: ACCEPT 2 M1
M6 sent message: ACCEPTED 4 M6
M3 sent message: ACCEPTED 2 M3
M5 sent message: ACCEPTED 2 M5
M2 sent message: ACCEPT 4 M2
M5 sent message: ACCEPTED 4 M5
M2 sent message: ACCEPT 4 M2
M8 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M7 sent message: ACCEPTED 4 M7
M1 sent message: ACCEPT 2 M1
M6 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M2 sent message: FINALISE 4 M2
M9 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M8 sent message: ACCEPTED 4 M8
M3 acknowledged election winner is: 4
M1 sent message: ACCEPT 2 M1
M1 sent message: ACCEPT 2 M1
M4 acknowledged election winner is: 4
M2 sent message: FINALISE 4 M2
M2 sent message: FINALISE 4 M2
M7 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 2 M6
M6 acknowledged election winner is: 4
M9 sent message: ACCEPTED 4 M9
M1 sent message: ACCEPT 2 M1
M8 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M9 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 2 M8
M9 sent message: ACCEPTED 2 M9
M2 sent message: FINALISE 4 M2
M5 acknowledged election winner is: 4
M2 sent message: FINALISE 4 M2
M7 sent message: ACCEPTED 2 M7
M7 acknowledged election winner is: 4
M2 sent message: FINALISE 4 M2
M8 acknowledged election winner is: 4
M2 sent message: FINALISE 4 M2

M9 acknowledged election winner is: 4
Election winner is M2
RELEASING PORTS
################################
TEST 1.B COMPLETED
```

Test 1.c: Concurrent: Three proposers (ImmediateResponseTest3.java)

```
##########################################################
TEST 1.C: THREE CONCURRENT PROPOSERS, IMMEDIATE RESPONSE
##########################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M3 proposing new proposalID 3 (Attempt 1)
M2 proposing new proposalID 2 (Attempt 1)
M1 proposing new proposalID 1 (Attempt 1)
M3 sent message: PREPARE 3 M3
M1 sent message: PREPARE 1 M1
M3 sent message: PREPARE 3 M3
M1 sent message: PREPARE 1 M1
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M2 sent message: PREPARE 2 M2
M8 sending PROMISE for proposal: 3 to proposer: M3
M9 sending PROMISE for proposal: 3 to proposer: M3
M4 sending PROMISE for proposal: 3 to proposer: M3
M9 sending PROMISE for proposal: 1 to proposer: M1
M6 sending PROMISE for proposal: 3 to proposer: M3
M1 recorded PROMISE from M9
M7 sending PROMISE for proposal: 3 to proposer: M3
M2 sent message: PREPARE 2 M2
M8 sent message: PROMISE 3 M8
M5 sending PROMISE for proposal: 1 to proposer: M1
M5 sending PROMISE for proposal: 3 to proposer: M3
M5 sent message: PROMISE 1 M5
M9 sent message: PROMISE 3 M9
M1 recorded PROMISE from M5
M4 sent message: PROMISE 3 M4
M3 recorded PROMISE from M8
M9 sent message: PROMISE 1 M9
M3 recorded PROMISE from M5
M6 sent message: PROMISE 3 M6
M3 recorded PROMISE from M7
M7 sent message: PROMISE 3 M7
M2 sent message: PREPARE 2 M2
M5 sent message: PROMISE 3 M5
M2 sent message: PREPARE 2 M2
M3 recorded PROMISE from M6
M2 sent message: PREPARE 2 M2
M3 recorded PROMISE from M4
M3 received majority PROMISES, broadcasting ACCEPT.
M3 sent message: ACCEPT 3 M3
M3 sent message: ACCEPT 3 M3
M3 sent message: ACCEPT 3 M3
M3 sent message: ACCEPT 3 M3
M3 sent message: ACCEPT 3 M3
```

```
M7 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M5 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M4 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M3 sent message: ACCEPT 3 M3
M8 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M9 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M5 sent message: ACCEPTED 3 M5
M7 sent message: ACCEPTED 3 M7
M3 recorded PROMISE from M9
M4 sent message: ACCEPTED 3 M4
M6 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M8 sent message: ACCEPTED 3 M8
M6 sent message: ACCEPTED 3 M6
M9 sent message: ACCEPTED 3 M9
M3 received majority PROMISES, broadcasting ACCEPT.
M3 sent message: ACCEPT 3 M3
M4 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M3 sent message: ACCEPT 3 M3
M4 sent message: ACCEPTED 3 M4
M3 sent message: ACCEPT 3 M3
M5 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M5 sent message: ACCEPTED 3 M5
M3 sent message: ACCEPT 3 M3
M7 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M3 sent message: ACCEPT 3 M3
M6 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M8 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M6 sent message: ACCEPTED 3 M6
M8 sent message: ACCEPTED 3 M8
M7 sent message: ACCEPTED 3 M7
M3 sent message: ACCEPT 3 M3
M9 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M3
M9 sent message: ACCEPTED 3 M9
M3 sent message: FINALISE 3 M3
M3 sent message: FINALISE 3 M3
M3 sent message: FINALISE 3 M3
M4 acknowledged election winner is: 3
M3 sent message: FINALISE 3 M3
M7 acknowledged election winner is: 3
M3 sent message: FINALISE 3 M3
M6 acknowledged election winner is: 3
M3 sent message: FINALISE 3 M3
M5 acknowledged election winner is: 3
M9 acknowledged election winner is: 3

M8 acknowledged election winner is: 3
Election winner is M3
RELEASING PORTS
#################################
TEST 1.C COMPLETED
```

Test 2: Members with suggested delay profiles

Test 2.a: One proposer (MemberDelayTest1.java)

```
#####################################################
TEST 2.A: ONE PROPOSER WITH SUGGESTED DELAY PROFILES
#####################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M1 is responding immediately.
M1 is responding immediately.
M1 is responding immediately.
M1 is responding immediately.
M1 is responding immediately.
M1 is responding immediately.
M1 is responding immediately.
M1 is responding immediately.
M2 Very delayed, in the hills
M3 delayed connection...
M5 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M1 proposing new proposalID 2 (Attempt 1)
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M1 sent message: PREPARE 2 M1
M8 sending PROMISE for proposal: 2 to proposer: M1
M8 sent message: PROMISE 2 M8
M1 recorded PROMISE from M8
M3 sending PROMISE for proposal: 2 to proposer: M1
M3 sent message: PROMISE 2 M3
M1 recorded PROMISE from M3
M7 sending PROMISE for proposal: 2 to proposer: M1
M7 sent message: PROMISE 2 M7
M1 recorded PROMISE from M7
M6 sending PROMISE for proposal: 2 to proposer: M1
M6 sent message: PROMISE 2 M6
M1 recorded PROMISE from M6
M5 sending PROMISE for proposal: 2 to proposer: M1
M5 sent message: PROMISE 2 M5
M1 recorded PROMISE from M5
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 2 M1
M1 sent message: ACCEPT 2 M1
M1 sent message: ACCEPT 2 M1
```

```
M1 sent message: ACCEPT 2 M1
M1 sent message: ACCEPT 2 M1
M1 sent message: ACCEPT 2 M1
M1 sent message: ACCEPT 2 M1
M5 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M3 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 2 M5
M3 sent message: ACCEPTED 2 M3
M6 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 2 M6
M7 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 2 M1
M7 sent message: ACCEPTED 2 M7
M8 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 2 M8
M1 sent message: FINALISE 2 M1
M1 sent message: FINALISE 2 M1
M1 sent message: FINALISE 2 M1
M1 sent message: FINALISE 2 M1
M1 sent message: FINALISE 2 M1
M1 sent message: FINALISE 2 M1
M1 sent message: FINALISE 2 M1
M1 sent message: FINALISE 2 M1
M3 acknowledged election winner is: 2

M6 acknowledged election winner is: 2
M7 acknowledged election winner is: 2
M8 acknowledged election winner is: 2
M5 acknowledged election winner is: 2
Election winner is M1
RELEASING PORTS
###############################
TEST 2.A COMPLETED
###############################
```

Test 2. b: Concurrent: Two proposers M1 and M2 (MemberDelayTest2.java)

CASE 1: M1 wins due to M2 delays despite m2 having a higher proposal.

```
###############################################################
TEST 2.B: TWO CONCURRENT PROPOSERS SUGGESTED DELAY PROFILES
###############################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hillsM3 is not responding. Maybe camping :))
M1 proposing new proposalID 1 (Attempt 1)
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
```

```
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M3 sending PROMISE for proposal: 1 to proposer: M1
M7 sending PROMISE for proposal: 1 to proposer: M1
M6 sending PROMISE for proposal: 1 to proposer: M1
M6 sent message: PROMISE 1 M6
M4 sending PROMISE for proposal: 1 to proposer: M1
M8 sending PROMISE for proposal: 1 to proposer: M1
M3 sent message: PROMISE 1 M3
M8 sent message: PROMISE 1 M8
M4 sent message: PROMISE 1 M4
M9 sending PROMISE for proposal: 1 to proposer: M1
M7 sent message: PROMISE 1 M7
M1 recorded PROMISE from M3
M5 sending PROMISE for proposal: 1 to proposer: M1
M9 sent message: PROMISE 1 M9
M2 proposing new proposalID 2 (Attempt 1)
M1 recorded PROMISE from M9
M2 sent message: PREPARE 2 M2
M1 recorded PROMISE from M8
M2 sent message: PREPARE 2 M2
M1 recorded PROMISE from M4
M5 sending PROMISE for proposal: 2 to proposer: M2
M5 sent message: PROMISE 1 M5
M5 sent message: PROMISE 2 M5
M2 sent message: PREPARE 2 M2
M3 sending PROMISE for proposal: 2 to proposer: M2
M2 sent message: PREPARE 2 M2
M3 sent message: PROMISE 2 M3
M2 sent message: PREPARE 2 M2
M4 sending PROMISE for proposal: 2 to proposer: M2
M2 sent message: PREPARE 2 M2
M4 sent message: PROMISE 2 M4
M1 recorded PROMISE from M7
M8 sending PROMISE for proposal: 2 to proposer: M2
M2 recorded PROMISE from M5
M2 sent message: PREPARE 2 M2
M7 sending PROMISE for proposal: 2 to proposer: M2
M6 sending PROMISE for proposal: 2 to proposer: M2
M9 sending PROMISE for proposal: 2 to proposer: M2
M1 received majority PROMISES, broadcasting ACCEPT.
M8 sent message: PROMISE 2 M8
M2 recorded PROMISE from M3
M7 sent message: PROMISE 2 M7
M6 sent message: PROMISE 2 M6
M9 sent message: PROMISE 2 M9
M3 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 1 M1
M2 recorded PROMISE from M9
M3 sent message: ACCEPTED 1 M3
M1 sent message: ACCEPT 1 M1
M2 recorded PROMISE from M6
M1 sent message: ACCEPT 1 M1
M4 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M6 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 1 M4
M6 sent message: ACCEPTED 1 M6
M5 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M2 recorded PROMISE from M7
M5 sent message: ACCEPTED 1 M5
M1 sent message: ACCEPT 1 M1
M2 received majority PROMISES, broadcasting ACCEPT.
```

```
M1 sent message: ACCEPT 1 M1
M7 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M2 sent message: ACCEPT 2 M2
M2 sent message: ACCEPT 2 M2
M3 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M2 sent message: ACCEPT 2 M2
M1 sent message: ACCEPT 1 M1
M3 sent message: ACCEPTED 2 M3
M6 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M1 sent message: ACCEPT 1 M1
M8 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M5 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M7 sent message: ACCEPTED 1 M7
M4 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M2 sent message: ACCEPT 2 M2
M6 sent message: ACCEPTED 2 M6
M7 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M1 recorded PROMISE from M6
M1 received majority PROMISES, broadcasting ACCEPT.
M8 sent message: ACCEPTED 1 M8
M9 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 2 M5
M4 sent message: ACCEPTED 2 M4
M2 sent message: ACCEPT 2 M2
M7 sent message: ACCEPTED 2 M7
M1 sent message: ACCEPT 1 M1
M3 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M3 sent message: ACCEPTED 1 M3
M9 sent message: ACCEPTED 1 M9
M2 sent message: ACCEPT 2 M2
M8 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M1 sent message: ACCEPT 1 M1
M4 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 2 M8
M2 sent message: ACCEPT 2 M2
M9 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M1 sent message: ACCEPT 1 M1
M4 sent message: ACCEPTED 1 M4
M5 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M2 recorded PROMISE from M8
M1 sent message: ACCEPT 1 M1
M9 sent message: ACCEPTED 2 M9
M5 sent message: ACCEPTED 1 M5
M6 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M2 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 1 M1
M7 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 1 M6
M7 sent message: ACCEPTED 1 M7
M2 sent message: ACCEPT 2 M2
M1 sent message: ACCEPT 1 M1
M8 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 1 M1
M8 sent message: ACCEPTED 1 M8
M3 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M2 sent message: ACCEPT 2 M2
M4 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M5 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M9 received ACCEPT for proposal: 1, sending ACCEPTED to proposer: M1
M3 sent message: ACCEPTED 2 M3
M2 sent message: ACCEPT 2 M2
M3 acknowledged election winner is: 1
M5 sent message: ACCEPTED 2 M5
M1 sent message: FINALISE 1 M1
M4 sent message: ACCEPTED 2 M4
```

```
M9 sent message: ACCEPTED 1 M9
M2 sent message: ACCEPT 2 M2
M6 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M2 sent message: ACCEPT 2 M2
M1 sent message: FINALISE 1 M1
M7 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M1 sent message: FINALISE 1 M1
M7 sent message: ACCEPTED 2 M7
M1 sent message: FINALISE 1 M1
M4 acknowledged election winner is: 1
M7 acknowledged election winner is: 1
M2 sent message: ACCEPT 2 M2
M6 sent message: ACCEPTED 2 M6
M8 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M1 sent message: FINALISE 1 M1
M6 acknowledged election winner is: 1
M5 acknowledged election winner is: 1
M2 sent message: ACCEPT 2 M2
M9 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M9 sent message: ACCEPTED 2 M9
M8 sent message: ACCEPTED 2 M8
M1 sent message: FINALISE 1 M1
M8 acknowledged election winner is: 1
M1 sent message: FINALISE 1 M1

M9 acknowledged election winner is: 1
Election winner is M1
RELEASING PORTS
################################
TEST 2.B COMPLETED
################################
```

CASE 2: M2 is at café, M2 wins

```
################################################################
TEST 2.B: TWO CONCURRENT PROPOSERS SUGGESTED DELAY PROFILES
################################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M1 is responding immediately.
M3 is not responding. Maybe camping :))
M2 Very delayed, in the hills
M2 is responding instantly (at café).
M1 is responding immediately.
M3 delayed connection...
M1 is responding immediately.
M2 is responding instantly (at café).
M3 is not responding. Maybe camping :))
M1 is responding immediately.
M2 Very delayed, in the hills
M3 delayed connection...
M1 is responding immediately.
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))
M1 is responding immediately.
M2 is responding instantly (at café).
M3 is not responding. Maybe camping :))
M3 delaying response due to busy schedule...
```

```
M4 delaying response due to busy schedule...
M4 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M1 proposing new proposalID 1 (Attempt 1)
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M2 proposing new proposalID 2 (Attempt 1)
M2 sent message: PREPARE 2 M2
M3 sending PROMISE for proposal: 1 to proposer: M1
M2 sent message: PREPARE 2 M2
M2 sent message: PREPARE 2 M2
M2 sent message: PREPARE 2 M2
M2 sent message: PREPARE 2 M2
M2 sent message: PREPARE 2 M2
M3 sent message: PROMISE 1 M3
M2 sent message: PREPARE 2 M2
M1 recorded PROMISE from M3
M7 sending PROMISE for proposal: 1 to proposer: M1
M7 sent message: PROMISE 1 M7
M1 recorded PROMISE from M7
M4 sending PROMISE for proposal: 2 to proposer: M2
M4 sent message: PROMISE 2 M4
M2 recorded PROMISE from M4
M7 sending PROMISE for proposal: 2 to proposer: M2
M7 sent message: PROMISE 2 M7
M9 sending PROMISE for proposal: 2 to proposer: M2
M9 sent message: PROMISE 2 M9
M8 sending PROMISE for proposal: 2 to proposer: M2
M8 sent message: PROMISE 2 M8
M6 sending PROMISE for proposal: 2 to proposer: M2
M6 sent message: PROMISE 2 M6
M5 sending PROMISE for proposal: 2 to proposer: M2
M5 sent message: PROMISE 2 M5
M3 sending PROMISE for proposal: 2 to proposer: M2
M3 sent message: PROMISE 2 M3
M2 recorded PROMISE from M3
M2 recorded PROMISE from M7
M2 recorded PROMISE from M8
M2 recorded PROMISE from M9
M2 received majority PROMISES, broadcasting ACCEPT.
M2 sent message: ACCEPT 2 M2
M2 sent message: ACCEPT 2 M2
M2 sent message: ACCEPT 2 M2
M2 sent message: ACCEPT 2 M2
M2 sent message: ACCEPT 2 M2
M3 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M4 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M5 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M3 sent message: ACCEPTED 2 M3
M4 sent message: ACCEPTED 2 M4
M7 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
```

```
M7 sent message: ACCEPTED 2 M7
M8 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M8 sent message: ACCEPTED 2 M8
M2 sent message: ACCEPT 2 M2
M5 sent message: ACCEPTED 2 M5
M2 sent message: ACCEPT 2 M2
M6 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M9 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M2
M9 sent message: ACCEPTED 2 M9
M6 sent message: ACCEPTED 2 M6
M2 sent message: FINALISE 2 M2
M2 sent message: FINALISE 2 M2
M2 sent message: FINALISE 2 M2
M2 sent message: FINALISE 2 M2
M2 sent message: FINALISE 2 M2
M2 sent message: FINALISE 2 M2
M2 sent message: FINALISE 2 M2

M7 acknowledged election winner is: 2
M9 acknowledged election winner is: 2
M3 acknowledged election winner is: 2
M4 acknowledged election winner is: 2
M5 acknowledged election winner is: 2
M6 acknowledged election winner is: 2
M8 acknowledged election winner is: 2
Election winner is M2
RELEASING PORTS
################################
TEST 2.B COMPLETED
```

Test 2. c: Concurrent: Two proposers M2 and M3 (MemberDelayTest3.java)

Scenario 1: Due to M2's delay, M3 has a chance at winning despite M3 having small delays.

```
############################################################
TEST 2.C: TWO CONCURRENT PROPOSERS SUGGESTED DELAY PROFILES
############################################################
M2 is online on port 5001
M3 is online on port 5002
M1 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M3 delayed connection...
M2 is responding instantly (at café).
M2 Very delayed, in the hills
M3 delayed connection...
M3 delayed connection...
M2 Very delayed, in the hills
M3 delayed connection...
M2 Very delayed, in the hills
M3 delayed connection...
M2 Very delayed, in the hills
M2 Very delayed, in the hills
M3 delayed connection...
M2 Very delayed, in the hills
M3 delayed connection...
M1 is responding immediately.
M1 is responding immediately.
```

```
M4 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M2 proposing new proposalID 4 (Attempt 1)
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M1 sending PROMISE for proposal: 4 to proposer: M2
M3 proposing new proposalID 2 (Attempt 1)
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M1 sent message: PROMISE 4 M1
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M8 sending PROMISE for proposal: 2 to proposer: M3
M8 sent message: PROMISE 2 M8
M3 recorded PROMISE from M8
M5 sending PROMISE for proposal: 4 to proposer: M2
M5 sent message: PROMISE 4 M5
M6 sending PROMISE for proposal: 2 to proposer: M3
M6 sent message: PROMISE 2 M6
M3 recorded PROMISE from M6
M9 sending PROMISE for proposal: 2 to proposer: M3
M9 sent message: PROMISE 2 M9
M3 recorded PROMISE from M9
M6 sending PROMISE for proposal: 4 to proposer: M2
M6 sent message: PROMISE 4 M6
M7 sending PROMISE for proposal: 2 to proposer: M3
M7 sent message: PROMISE 2 M7
M3 recorded PROMISE from M7
M4 sending PROMISE for proposal: 2 to proposer: M3
M4 sent message: PROMISE 2 M4
M3 recorded PROMISE from M4
M3 received majority PROMISES, broadcasting ACCEPT.
M3 sent message: ACCEPT 2 M3
M3 sent message: ACCEPT 2 M3
M3 sent message: ACCEPT 2 M3
M3 sent message: ACCEPT 2 M3
M3 sent message: ACCEPT 2 M3
M3 sent message: ACCEPT 2 M3
M1 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M3
M6 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M3
M4 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M3
M1 sent message: ACCEPTED 2 M1
M7 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M3
M8 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M3
M7 sent message: ACCEPTED 2 M7
M3 sent message: ACCEPT 2 M3
M9 received ACCEPT for proposal: 2, sending ACCEPTED to proposer: M3
```

```
M9 sent message: ACCEPTED 2 M9
M6 sent message: ACCEPTED 2 M6
M4 sent message: ACCEPTED 2 M4
M3 sent message: FINALISE 2 M3
M3 sent message: FINALISE 2 M3
M3 sent message: FINALISE 2 M3
M8 sent message: ACCEPTED 2 M8
M4 acknowledged election winner is: 2
M1 acknowledged election winner is: 2
M3 sent message: FINALISE 2 M3
M6 acknowledged election winner is: 2
M3 sent message: FINALISE 2 M3
M7 acknowledged election winner is: 2
M3 sent message: FINALISE 2 M3
M3 sent message: FINALISE 2 M3
M8 acknowledged election winner is: 2
M9 acknowledged election winner is: 2

Election winner is M3
RELEASING PORTS
#################################
TEST 2.C COMPLETED
#################################
```

Scenario 2: If M2 is at cafe or M3 is not responding, M2 has a chance at winning.

```
###############################################################
TEST 2.C: TWO CONCURRENT PROPOSERS SUGGESTED DELAY PROFILES
###############################################################
M2 is online on port 5001
M3 is online on port 5002
M1 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M3 delayed connection...
M2 is responding instantly (at café).
M2 Very delayed, in the hills
M3 delayed connection...
M2 is responding instantly (at café).
M3 is not responding. Maybe camping :))
M2 Very delayed, in the hills
M3 delayed connection...
M2 Very delayed, in the hills
M3 delayed connection...
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))
M2 is responding instantly (at café).
M3 delayed connection...
M1 is responding immediately.
M1 is responding immediately.
M5 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
```

```
M9 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M2 proposing new proposalID 4 (Attempt 1)
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M3 proposing new proposalID 2 (Attempt 1)
M1 sending PROMISE for proposal: 4 to proposer: M2
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M1 sent message: PROMISE 4 M1
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M3 sent message: PREPARE 2 M3
M8 sending PROMISE for proposal: 4 to proposer: M2
M8 sent message: PROMISE 4 M8
M6 sending PROMISE for proposal: 4 to proposer: M2
M6 sent message: PROMISE 4 M6
M5 sending PROMISE for proposal: 2 to proposer: M3
M5 sent message: PROMISE 2 M5
M3 recorded PROMISE from M5
M4 sending PROMISE for proposal: 4 to proposer: M2
M4 sent message: PROMISE 4 M4
M2 recorded PROMISE from M4
M7 sending PROMISE for proposal: 4 to proposer: M2
M7 sent message: PROMISE 4 M7
M9 sending PROMISE for proposal: 2 to proposer: M3
M9 sent message: PROMISE 2 M9
M3 recorded PROMISE from M9
M9 sending PROMISE for proposal: 4 to proposer: M2
M9 sent message: PROMISE 4 M9
M2 recorded PROMISE from M9
M5 sending PROMISE for proposal: 4 to proposer: M2
M5 sent message: PROMISE 4 M5
M2 recorded PROMISE from M5
M2 recorded PROMISE from M6
M2 recorded PROMISE from M1
M2 received majority PROMISES, broadcasting ACCEPT.
M2 sent message: ACCEPT 4 M2
M2 sent message: ACCEPT 4 M2
M2 sent message: ACCEPT 4 M2
M2 sent message: ACCEPT 4 M2
M2 sent message: ACCEPT 4 M2
M2 sent message: ACCEPT 4 M2
M2 sent message: ACCEPT 4 M2
M1 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M5 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M1 sent message: ACCEPTED 4 M1
M5 sent message: ACCEPTED 4 M5
M7 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M4 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M7 sent message: ACCEPTED 4 M7
M6 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M6 sent message: ACCEPTED 4 M6
M9 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M8 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M2
M8 sent message: ACCEPTED 4 M8
M4 sent message: ACCEPTED 4 M4
```

```
M9 sent message: ACCEPTED 4 M9
M2 sent message: FINALISE 4 M2
M2 sent message: FINALISE 4 M2
M2 sent message: FINALISE 4 M2
M2 sent message: FINALISE 4 M2
M2 sent message: FINALISE 4 M2
M2 sent message: FINALISE 4 M2
M2 sent message: FINALISE 4 M2
M4 acknowledged election winner is: 4

M7 acknowledged election winner is: 4
M9 acknowledged election winner is: 4
M1 acknowledged election winner is: 4
M5 acknowledged election winner is: 4
M6 acknowledged election winner is: 4
M8 acknowledged election winner is: 4
Election winner is M2
RELEASING PORTS
################################
TEST 2.C COMPLETED
################################
```

Test 3: Failover when a proposer goes offline
Test 3.a: Two concurrent proposers, one shuts down (ShutdownTest1.java)

```
####################################################
TEST 3.A: TWO CONCURRENT PROPOSERS, ONE SHUTS DOWN
####################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M1 is responding immediately.
M1 is responding immediately.
M2 Very delayed, in the hills
M2 is responding instantly (at café).
M1 is responding immediately.
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M3 delayed connection...
M3 delayed connection...
M4 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
```

```
M9 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M2 proposing new proposalID 2 (Attempt 1)
M1 proposing new proposalID 1 (Attempt 1)
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
Shutting down M2...
M3 sending PROMISE for proposal: 2 to proposer: M2
M3 sent message: PROMISE 2 M3
M5 sending PROMISE for proposal: 2 to proposer: M2
M5 sent message: PROMISE 2 M5
M9 sending PROMISE for proposal: 2 to proposer: M2
M9 sent message: PROMISE 2 M9
M4 sending PROMISE for proposal: 1 to proposer: M1
M4 sent message: PROMISE 1 M4
M1 recorded PROMISE from M4
M4 sending PROMISE for proposal: 2 to proposer: M2
M4 sent message: PROMISE 2 M4
M2 recorded PROMISE from M4
M7 sending PROMISE for proposal: 1 to proposer: M1
M7 sent message: PROMISE 1 M7
M1 recorded PROMISE from M7
M7 sending PROMISE for proposal: 2 to proposer: M2
M7 sent message: PROMISE 2 M7
M6 sending PROMISE for proposal: 2 to proposer: M2
M6 sent message: PROMISE 2 M6
M8 sending PROMISE for proposal: 1 to proposer: M1
M8 sent message: PROMISE 1 M8
M1 recorded PROMISE from M8
M8 sending PROMISE for proposal: 2 to proposer: M2
M8 sent message: PROMISE 2 M8
M2 recorded PROMISE from M7
M2 recorded PROMISE from M5
M2 recorded PROMISE from M6
M2 recorded PROMISE from M9
M2 received majority PROMISES, broadcasting ACCEPT.
M2 recorded PROMISE from M8
M2 received majority PROMISES, broadcasting ACCEPT.
M2 recorded PROMISE from M3
M2 received majority PROMISES, broadcasting ACCEPT.
M1 did not receive a majority within timeout, retrying proposal.
M1 proposing new proposalID 3 (Attempt 2)
M1 sent message: PREPARE 3 M1
M1 sent message: PREPARE 3 M1
M1 sent message: PREPARE 3 M1
M1 sent message: PREPARE 3 M1
M1 sent message: PREPARE 3 M1
M1 sent message: PREPARE 3 M1
M1 sent message: PREPARE 3 M1
M3 sending PROMISE for proposal: 3 to proposer: M1
M4 sending PROMISE for proposal: 3 to proposer: M1
M4 sent message: PROMISE 3 M4
M9 sending PROMISE for proposal: 3 to proposer: M1
```

```
M6 sending PROMISE for proposal: 3 to proposer: M1
M6 sent message: PROMISE 3 M6
M8 sending PROMISE for proposal: 3 to proposer: M1
M1 recorded PROMISE from M3
M8 sent message: PROMISE 3 M8
M5 sending PROMISE for proposal: 3 to proposer: M1
M7 sending PROMISE for proposal: 3 to proposer: M1
M7 sent message: PROMISE 3 M7
M3 sent message: PROMISE 3 M3
M9 sent message: PROMISE 3 M9
M1 recorded PROMISE from M9
M1 received majority PROMISES, broadcasting ACCEPT.
M5 sent message: PROMISE 3 M5
M1 sent message: ACCEPT 3 M1
M1 sent message: ACCEPT 3 M1
M1 sent message: ACCEPT 3 M1
M1 sent message: ACCEPT 3 M1
M1 sent message: ACCEPT 3 M1
M1 sent message: ACCEPT 3 M1
M7 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M6 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M8 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M9 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M4 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M3 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 3 M1
M3 sent message: ACCEPTED 3 M3
M5 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 3 M6
M5 sent message: ACCEPTED 3 M5
M7 sent message: ACCEPTED 3 M7
M4 sent message: ACCEPTED 3 M4
M8 sent message: ACCEPTED 3 M8
M9 sent message: ACCEPTED 3 M9
M1 recorded PROMISE from M5
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 3 M1
M3 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 3 M1
M3 sent message: ACCEPTED 3 M3
M1 sent message: ACCEPT 3 M1
M4 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 3 M1
M5 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M6 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 3 M1
M7 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 3 M4
M6 sent message: ACCEPTED 3 M6
M1 sent message: ACCEPT 3 M1
M1 sent message: ACCEPT 3 M1
M8 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 3 M5
M7 sent message: ACCEPTED 3 M7
M9 received ACCEPT for proposal: 3, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 3 M8
M9 sent message: ACCEPTED 3 M9
M1 sent message: FINALISE 3 M1
M3 acknowledged election winner is: 3
M1 sent message: FINALISE 3 M1
M1 sent message: FINALISE 3 M1
M1 sent message: FINALISE 3 M1
M5 acknowledged election winner is: 3
M4 acknowledged election winner is: 3
M1 sent message: FINALISE 3 M1
```

```
M7 acknowledged election winner is: 3
M6 acknowledged election winner is: 3
M1 sent message: FINALISE 3 M1
M8 acknowledged election winner is: 3
M1 sent message: FINALISE 3 M1
M9 acknowledged election winner is: 3

Election winner is M1
RELEASING PORTS
#################################
TEST 3.A COMPLETED
#################################
```

Test 3.b: Three concurrent proposers, one shuts down (ShutdownTest2.java)

Case 1: M1 retries later.
```
######################################################
TEST 3.B: THREE CONCURRENT PROPOSERS, ONE SHUTS DOWN
######################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M1 is responding immediately.
M3 is not responding. Maybe camping :))
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M3 delayed connection...
M1 is responding immediately.
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))M4 delaying response due to busy schedule...
M4 delaying response due to busy schedule...
M4 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M1 proposing new proposalID 1 (Attempt 1)
M2 proposing new proposalID 2 (Attempt 1)
M2 sent message: PREPARE 2 M2
M2 sent message: PREPARE 2 M2
M2 sent message: PREPARE 2 M2
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
```

```
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M3 proposing new proposalID 3 (Attempt 1)
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
Shutting down M3...
M6 sending PROMISE for proposal: 3 to proposer: M3
M9 sending PROMISE for proposal: 3 to proposer: M3
M6 sent message: PROMISE 3 M6
M9 sent message: PROMISE 3 M9
M3 recorded PROMISE from M9
M5 sending PROMISE for proposal: 3 to proposer: M3
M5 sent message: PROMISE 3 M5
M7 sending PROMISE for proposal: 1 to proposer: M1
M7 sent message: PROMISE 1 M7
M1 recorded PROMISE from M7
M4 sending PROMISE for proposal: 3 to proposer: M3
M4 sent message: PROMISE 3 M4
M3 recorded PROMISE from M5
M7 sending PROMISE for proposal: 2 to proposer: M2
M7 sent message: PROMISE 2 M7
M2 recorded PROMISE from M7
M8 sending PROMISE for proposal: 1 to proposer: M1
M8 sent message: PROMISE 1 M8
M1 recorded PROMISE from M8
M8 sending PROMISE for proposal: 2 to proposer: M2
M8 sent message: PROMISE 2 M8
M3 recorded PROMISE from M6
M7 sending PROMISE for proposal: 3 to proposer: M3
M7 sent message: PROMISE 3 M7
M3 recorded PROMISE from M7
M8 sending PROMISE for proposal: 3 to proposer: M3
M8 sent message: PROMISE 3 M8
M3 recorded PROMISE from M8
M3 received majority PROMISES, broadcasting ACCEPT.
M3 recorded PROMISE from M4
M3 received majority PROMISES, broadcasting ACCEPT.
M2 recorded PROMISE from M8
M2 did not receive a majority within timeout, retrying proposal.
M1 did not receive a majority within timeout, retrying proposal.
M2 proposing new proposalID 4 (Attempt 2)
M1 proposing new proposalID 5 (Attempt 2)
M2 sent message: PREPARE 4 M2
M4 sending PROMISE for proposal: 5 to proposer: M1
M4 sent message: PROMISE 5 M4
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M5 sending PROMISE for proposal: 4 to proposer: M2
M5 sent message: PROMISE 4 M5
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
M2 sent message: PREPARE 4 M2
```

```
M2 sent message: PREPARE 4 M2
M1 recorded PROMISE from M4
M5 sending PROMISE for proposal: 5 to proposer: M1
M5 sent message: PROMISE 5 M5
M6 sending PROMISE for proposal: 5 to proposer: M1
M6 sent message: PROMISE 5 M6
M7 sending PROMISE for proposal: 5 to proposer: M1
M7 sent message: PROMISE 5 M7
M9 sending PROMISE for proposal: 5 to proposer: M1
M9 sent message: PROMISE 5 M9
M8 sending PROMISE for proposal: 5 to proposer: M1
M8 sent message: PROMISE 5 M8
M2 recorded PROMISE from M5
M1 recorded PROMISE from M5
M1 recorded PROMISE from M9
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M6 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 5 M6
M9 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M9 sent message: ACCEPTED 5 M9
M8 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 5 M8
M4 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 5 M4
M5 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 5 M5
M7 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M7 sent message: ACCEPTED 5 M7
M1 recorded PROMISE from M6
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M4 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M5 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 5 M5
M6 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 5 M6
M7 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M7 sent message: ACCEPTED 5 M7
M8 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 5 M8
M1 sent message: ACCEPT 5 M1
M9 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M9 sent message: ACCEPTED 5 M9
M4 sent message: ACCEPTED 5 M4
M1 sent message: FINALISE 5 M1
M1 sent message: FINALISE 5 M1
M1 sent message: FINALISE 5 M1
M1 sent message: FINALISE 5 M1
M1 sent message: FINALISE 5 M1
M1 sent message: FINALISE 5 M1

M5 acknowledged election winner is: 5
M6 acknowledged election winner is: 5
M7 acknowledged election winner is: 5
M8 acknowledged election winner is: 5
```

```
M9 acknowledged election winner is: 5
M4 acknowledged election winner is: 5
Election winner is M1
RELEASING PORTS
#################################
TEST 3.B COMPLETED
```

Case 2: M2 retries later

```
#########################################################
TEST 3.B: THREE CONCURRENT PROPOSERS, ONE SHUTS DOWN
#########################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M1 is responding immediately.
M1 is responding immediately.
M3 is not responding. Maybe camping :))
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M3 delayed connection...
M1 is responding immediately.
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))
M2 Very delayed, in the hills
M3 delayed connection...
M4 delaying response due to busy schedule...
M4 delaying response due to busy schedule...
M4 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M1 proposing new proposalID 1 (Attempt 1)
M2 proposing new proposalID 2 (Attempt 1)
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
```

```
M2 sent message: PREPARE 2 M2
M3 proposing new proposalID 3 (Attempt 1)
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M9 sending PROMISE for proposal: 3 to proposer: M3
M9 sent message: PROMISE 3 M9
Shutting down M3...
M5 sending PROMISE for proposal: 2 to proposer: M2
M5 sent message: PROMISE 2 M5
M7 sending PROMISE for proposal: 3 to proposer: M3
M7 sent message: PROMISE 3 M7
M6 sending PROMISE for proposal: 1 to proposer: M1
M6 sent message: PROMISE 1 M6
M1 recorded PROMISE from M6
M5 sending PROMISE for proposal: 3 to proposer: M3
M5 sent message: PROMISE 3 M5
M3 recorded PROMISE from M5
M4 sending PROMISE for proposal: 3 to proposer: M3
M4 sent message: PROMISE 3 M4
M3 recorded PROMISE from M4
M6 sending PROMISE for proposal: 2 to proposer: M2
M6 sent message: PROMISE 2 M6
M8 sending PROMISE for proposal: 3 to proposer: M3
M8 sent message: PROMISE 3 M8
M3 recorded PROMISE from M8
M3 recorded PROMISE from M9
M6 sending PROMISE for proposal: 3 to proposer: M3
M6 sent message: PROMISE 3 M6
M3 recorded PROMISE from M6
M3 received majority PROMISES, broadcasting ACCEPT.
M3 recorded PROMISE from M7
M3 received majority PROMISES, broadcasting ACCEPT.
M2 recorded PROMISE from M6
M2 recorded PROMISE from M5
M1 did not receive a majority within timeout, retrying proposal.
M2 did not receive a majority within timeout, retrying proposal.
M1 proposing new proposalID 4 (Attempt 2)
M2 proposing new proposalID 5 (Attempt 2)
M2 sent message: PREPARE 5 M2
M2 sent message: PREPARE 5 M2
M2 sent message: PREPARE 5 M2
M2 sent message: PREPARE 5 M2
M2 sent message: PREPARE 5 M2
M4 sending PROMISE for proposal: 5 to proposer: M2
M4 sent message: PROMISE 5 M4
M5 sending PROMISE for proposal: 5 to proposer: M2
M5 sent message: PROMISE 5 M5
M7 sending PROMISE for proposal: 5 to proposer: M2
M8 sending PROMISE for proposal: 5 to proposer: M2
M9 sending PROMISE for proposal: 5 to proposer: M2
M9 sent message: PROMISE 5 M9
M2 recorded PROMISE from M4
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M2 recorded PROMISE from M7
M2 recorded PROMISE from M8
M2 received majority PROMISES, broadcasting ACCEPT.
M2 sent message: ACCEPT 5 M2
M2 sent message: ACCEPT 5 M2
M2 sent message: ACCEPT 5 M2
```

```
M2 sent message: ACCEPT 5 M2
M2 sent message: ACCEPT 5 M2
M2 sent message: ACCEPT 5 M2
M2 sent message: PREPARE 5 M2
M9 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M2 recorded PROMISE from M9
M2 received majority PROMISES, broadcasting ACCEPT.
M2 sent message: ACCEPT 5 M2
M2 sent message: ACCEPT 5 M2
M6 sending PROMISE for proposal: 5 to proposer: M2
M6 sent message: PROMISE 5 M6
M6 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M6 sent message: ACCEPTED 5 M6
M6 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M6 sent message: ACCEPTED 5 M6
M7 sent message: PROMISE 5 M7
M7 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M7 sent message: ACCEPTED 5 M7
M8 sent message: PROMISE 5 M8
M8 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M8 sent message: ACCEPTED 5 M8
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M4 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M5 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M5 sent message: ACCEPTED 5 M5
M5 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M5 sent message: ACCEPTED 5 M5
M9 sent message: ACCEPTED 5 M9
M2 sent message: ACCEPT 5 M2
M2 sent message: ACCEPT 5 M2
M2 sent message: ACCEPT 5 M2
M7 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M7 sent message: ACCEPTED 5 M7
M8 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M4 sent message: ACCEPTED 5 M4
M2 sent message: ACCEPT 5 M2
M4 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M4 sent message: ACCEPTED 5 M4
M9 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M2
M9 sent message: ACCEPTED 5 M9
M8 sent message: ACCEPTED 5 M8
M2 sent message: FINALISE 5 M2
M2 sent message: FINALISE 5 M2
M2 sent message: FINALISE 5 M2
M2 sent message: FINALISE 5 M2
M4 acknowledged election winner is: 5
M5 acknowledged election winner is: 5
M6 acknowledged election winner is: 5
M7 acknowledged election winner is: 5
M2 sent message: FINALISE 5 M2
M8 acknowledged election winner is: 5
M2 sent message: FINALISE 5 M2
M9 acknowledged election winner is: 5

Election winner is M2
RELEASING PORTS
#################################
TEST 3.B COMPLETED
```

Case 3: M2 retries later but M2 connection is slow.

```
##########################################################
TEST 3.B: THREE CONCURRENT PROPOSERS, ONE SHUTS DOWN
##########################################################
M1 is responding immediately.
M3 is not responding. Maybe camping :))
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))
M1 is responding immediately.
M2 Very delayed, in the hills
M3 delayed connection...
M1 is responding immediately.
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))
M1 is responding immediately.
M2 Very delayed, in the hills
M3 delayed connection...
M4 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M1 proposing new proposalID 1 (Attempt 1)
M2 proposing new proposalID 2 (Attempt 1)
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M3 proposing new proposalID 3 (Attempt 1)
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
Shutting down M3...
M5 sending PROMISE for proposal: 3 to proposer: M3
M5 sent message: PROMISE 3 M5
M3 recorded PROMISE from M5
M6 sending PROMISE for proposal: 3 to proposer: M3
M6 sent message: PROMISE 3 M6
```

```
M3 recorded PROMISE from M6
M9 sending PROMISE for proposal: 3 to proposer: M3
M9 sent message: PROMISE 3 M9
M3 recorded PROMISE from M9
M7 sending PROMISE for proposal: 1 to proposer: M1
M7 sent message: PROMISE 1 M7
M1 recorded PROMISE from M7
M8 sending PROMISE for proposal: 1 to proposer: M1
M8 sent message: PROMISE 1 M8
M1 recorded PROMISE from M8
M7 sending PROMISE for proposal: 3 to proposer: M3
M7 sent message: PROMISE 3 M7
M3 recorded PROMISE from M7
M4 sending PROMISE for proposal: 2 to proposer: M2
M4 sent message: PROMISE 2 M4
M2 recorded PROMISE from M4
M4 sending PROMISE for proposal: 3 to proposer: M3
M4 sent message: PROMISE 3 M4
M3 recorded PROMISE from M4
M3 received majority PROMISES, broadcasting ACCEPT.
M8 sending PROMISE for proposal: 2 to proposer: M2
M8 sent message: PROMISE 2 M8
M8 sending PROMISE for proposal: 3 to proposer: M3
M8 sent message: PROMISE 3 M8
M3 recorded PROMISE from M8
M3 received majority PROMISES, broadcasting ACCEPT.
M2 recorded PROMISE from M8
M1 did not receive a majority within timeout, retrying proposal.
M1 proposing new proposalID 4 (Attempt 2)
M2 did not receive a majority within timeout, retrying proposal.
M2 proposing new proposalID 5 (Attempt 2)
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M4 sending PROMISE for proposal: 4 to proposer: M1
M4 sent message: PROMISE 4 M4
M4 sending PROMISE for proposal: 5 to proposer: M2
M4 sent message: PROMISE 5 M4
M2 sent message: PREPARE 5 M2
M2 sent message: PREPARE 5 M2
M2 sent message: PREPARE 5 M2
M2 sent message: PREPARE 5 M2
M2 sent message: PREPARE 5 M2
M5 sending PROMISE for proposal: 4 to proposer: M1
M5 sent message: PROMISE 4 M5
M6 sending PROMISE for proposal: 4 to proposer: M1
M6 sent message: PROMISE 4 M6
M2 sent message: PREPARE 5 M2
M7 sending PROMISE for proposal: 4 to proposer: M1
M8 sending PROMISE for proposal: 4 to proposer: M1
M9 sending PROMISE for proposal: 4 to proposer: M1
M8 sent message: PROMISE 4 M8
M9 sent message: PROMISE 4 M9
M5 sending PROMISE for proposal: 5 to proposer: M2
M5 sent message: PROMISE 5 M5
M1 recorded PROMISE from M4
M1 recorded PROMISE from M9
M6 sending PROMISE for proposal: 5 to proposer: M2
M1 recorded PROMISE from M5
M1 received majority PROMISES, broadcasting ACCEPT.
M6 sent message: PROMISE 5 M6
M1 sent message: ACCEPT 4 M1
```

```
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M7 sending PROMISE for proposal: 5 to proposer: M2
M7 sent message: PROMISE 5 M7
M5 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M8 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M9 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 4 M5
M8 sending PROMISE for proposal: 5 to proposer: M2
M8 sent message: PROMISE 5 M8
M9 sending PROMISE for proposal: 5 to proposer: M2
M9 sent message: PROMISE 5 M9
M1 recorded PROMISE from M6
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M7 sent message: PROMISE 4 M7
M2 recorded PROMISE from M5
M4 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M6 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 4 M4
M6 sent message: ACCEPTED 4 M6
M4 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M6 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 4 M4
M6 sent message: ACCEPTED 4 M6
M8 sent message: ACCEPTED 4 M8
M8 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 4 M8
M9 sent message: ACCEPTED 4 M9
M9 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M9 sent message: ACCEPTED 4 M9
M5 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M7 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 4 M5
M2 recorded PROMISE from M9
M7 sent message: ACCEPTED 4 M7
M1 sent message: FINALISE 4 M1
M4 acknowledged election winner is: 4
M7 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M5 acknowledged election winner is: 4
M1 sent message: FINALISE 4 M1
M7 sent message: ACCEPTED 4 M7
M1 sent message: FINALISE 4 M1
M6 acknowledged election winner is: 4
M1 sent message: FINALISE 4 M1
M7 acknowledged election winner is: 4
M1 sent message: FINALISE 4 M1
M8 acknowledged election winner is: 4
M1 sent message: FINALISE 4 M1
M9 acknowledged election winner is: 4

Election winner is M1
RELEASING PORTS
################################
TEST 3.B COMPLETED
################################
```

```
####################################################
TEST 3.C: THREE CONCURRENT PROPOSERS, TWO SHUTS DOWN
####################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M2 Very delayed, in the hills
M3 delayed connection...
M3 delayed connection...
M2 Very delayed, in the hills
M2 Very delayed, in the hills
M1 is responding immediately.
M1 is responding immediately.
M1 is responding immediately.
M3 delayed connection...
M1 is responding immediately.
M2 Very delayed, in the hills
M1 is responding immediately.
M2 Very delayed, in the hills
M3 delayed connection...
M3 delayed connection...
M1 is responding immediately.
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))M4 delaying response due to busy schedule...
M4 delaying response due to busy schedule...
M4 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M5 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M6 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M7 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M8 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M9 delaying response due to busy schedule...
M1 proposing new proposalID 1 (Attempt 1)
M2 proposing new proposalID 2 (Attempt 1)
M2 sent message: PREPARE 2 M2
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M1 sent message: PREPARE 1 M1
```

```
M3 proposing new proposalID 3 (Attempt 1)
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
Shutting down M2...
Shutting down M3...
M5 sending PROMISE for proposal: 1 to proposer: M1
M5 sent message: PROMISE 1 M5
M1 recorded PROMISE from M5
M8 sending PROMISE for proposal: 2 to proposer: M2
M8 sent message: PROMISE 2 M8
M2 recorded PROMISE from M8
M8 sending PROMISE for proposal: 3 to proposer: M3
M8 sent message: PROMISE 3 M8
M6 sending PROMISE for proposal: 2 to proposer: M2
M6 sent message: PROMISE 2 M6
M7 sending PROMISE for proposal: 1 to proposer: M1
M7 sent message: PROMISE 1 M7
M1 recorded PROMISE from M7
M4 sending PROMISE for proposal: 2 to proposer: M2
M4 sent message: PROMISE 2 M4
M2 recorded PROMISE from M4
M5 sending PROMISE for proposal: 3 to proposer: M3
M5 sent message: PROMISE 3 M5
M3 recorded PROMISE from M5
M3 recorded PROMISE from M8
M9 sending PROMISE for proposal: 3 to proposer: M3
M9 sent message: PROMISE 3 M9
M4 sending PROMISE for proposal: 3 to proposer: M3
M4 sent message: PROMISE 3 M4
M3 recorded PROMISE from M4
M3 recorded PROMISE from M9
M7 sending PROMISE for proposal: 3 to proposer: M3
M7 sent message: PROMISE 3 M7
M3 recorded PROMISE from M7
M3 received majority PROMISES, broadcasting ACCEPT.
M6 sending PROMISE for proposal: 3 to proposer: M3
M6 sent message: PROMISE 3 M6
M3 recorded PROMISE from M6
M3 received majority PROMISES, broadcasting ACCEPT.
M2 recorded PROMISE from M6
M1 did not receive a majority within timeout, retrying proposal.
M2 did not receive a majority within timeout, retrying proposal.
M2 proposing new proposalID 5 (Attempt 2)
M1 proposing new proposalID 4 (Attempt 2)
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M4 sending PROMISE for proposal: 4 to proposer: M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M1 sent message: PREPARE 4 M1
M6 sending PROMISE for proposal: 4 to proposer: M1
M6 sent message: PROMISE 4 M6
M5 sending PROMISE for proposal: 4 to proposer: M1
M8 sending PROMISE for proposal: 4 to proposer: M1
M8 sent message: PROMISE 4 M8
M1 recorded PROMISE from M4
M9 sending PROMISE for proposal: 4 to proposer: M1
M1 recorded PROMISE from M6
M4 sent message: PROMISE 4 M4
M1 recorded PROMISE from M8
```

```
M1 received majority PROMISES, broadcasting ACCEPT.
M7 sending PROMISE for proposal: 4 to proposer: M1
M1 sent message: ACCEPT 4 M1
M7 sent message: PROMISE 4 M7
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M5 sent message: PROMISE 4 M5
M4 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M7 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M6 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 4 M4
M6 sent message: ACCEPTED 4 M6
M1 recorded PROMISE from M9
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M9 sent message: PROMISE 4 M9
M4 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M9 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 4 M4
M9 sent message: ACCEPTED 4 M9
M5 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 4 M5
M5 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 4 M5
M7 sent message: ACCEPTED 4 M7
M8 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 4 M8
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M1 sent message: ACCEPT 4 M1
M6 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 4 M6
M7 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M1 sent message: FINALISE 4 M1
M7 sent message: ACCEPTED 4 M7
M9 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M9 sent message: ACCEPTED 4 M9
M8 received ACCEPT for proposal: 4, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 4 M8
M4 acknowledged election winner is: 4
M1 sent message: FINALISE 4 M1
M1 sent message: FINALISE 4 M1
M1 sent message: FINALISE 4 M1
M1 sent message: FINALISE 4 M1
M5 acknowledged election winner is: 4
M7 acknowledged election winner is: 4
M8 acknowledged election winner is: 4
M9 acknowledged election winner is: 4
M6 acknowledged election winner is: 4
M1 sent message: FINALISE 4 M1

Election winner is M1
RELEASING PORTS
################################
TEST 3.C COMPLETED
################################
```

```
##########################################################
TEST 3.D: THREE CONCURRENT PROPOSERS, VARYING SHUTDOWN
##########################################################
M1 is online on port 5001
M2 is online on port 5002
M3 is online on port 5003
M4 is online on port 5004
M5 is online on port 5005
M6 is online on port 5006
M7 is online on port 5007
M8 is online on port 5008
M9 is online on port 5009
M2 is responding instantly (at café).
M1 is responding immediately.
M3 delayed connection...
M1 is responding immediately.
M1 is responding immediately.
M2 Very delayed, in the hills
M2 Very delayed, in the hills
M3 delayed connection...
M1 is responding immediately.
M1 is responding immediately.
M3 delayed connection...
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))
M2 Very delayed, in the hills
M3 is not responding. Maybe camping :))
M1 is responding immediately.
M2 is responding instantly (at café).
M3 delayed connection...
M4 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M4 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M5 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M6 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M7 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M8 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M9 is delayed due to busy schedule...
M2 proposing new proposalID 2 (Attempt 1)
M1 proposing new proposalID 1 (Attempt 1)
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
M1 sent message: PREPARE 1 M1
M2 sent message: PREPARE 2 M2
```

```
M1 sent message: PREPARE 1 M1
M3 proposing new proposalID 3 (Attempt 1)
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
M3 sent message: PREPARE 3 M3
Shutting down M3...
M4 sending PROMISE for proposal: 2 to proposer: M2
M4 sent message: PROMISE 2 M4
M2 recorded PROMISE from M4
Shutting down M2...
M6 sending PROMISE for proposal: 1 to proposer: M1
M6 sent message: PROMISE 1 M6
M1 recorded PROMISE from M6
M9 sending PROMISE for proposal: 3 to proposer: M3
M9 sent message: PROMISE 3 M9
M5 sending PROMISE for proposal: 3 to proposer: M3
M5 sent message: PROMISE 3 M5
M3 recorded PROMISE from M9
M8 sending PROMISE for proposal: 2 to proposer: M2
M8 sent message: PROMISE 2 M8
M6 sending PROMISE for proposal: 2 to proposer: M2
M6 sent message: PROMISE 2 M6
M8 sending PROMISE for proposal: 3 to proposer: M3
M8 sent message: PROMISE 3 M8
M3 recorded PROMISE from M8
M3 recorded PROMISE from M5
M7 sending PROMISE for proposal: 1 to proposer: M1
M7 sent message: PROMISE 1 M7
M1 recorded PROMISE from M7
M7 sending PROMISE for proposal: 2 to proposer: M2
M7 sent message: PROMISE 2 M7
M4 sending PROMISE for proposal: 3 to proposer: M3
M4 sent message: PROMISE 3 M4
M3 recorded PROMISE from M4
M6 sending PROMISE for proposal: 3 to proposer: M3
M6 sent message: PROMISE 3 M6
M3 recorded PROMISE from M6
M3 received majority PROMISES, broadcasting ACCEPT.
M7 sending PROMISE for proposal: 3 to proposer: M3
M7 sent message: PROMISE 3 M7
M3 recorded PROMISE from M7
M3 received majority PROMISES, broadcasting ACCEPT.
M2 recorded PROMISE from M8
M2 recorded PROMISE from M7
M2 recorded PROMISE from M6
M2 did not receive a majority within timeout, retrying proposal.
M1 did not receive a majority within timeout, retrying proposal.
M2 proposing new proposalID 4 (Attempt 2)
M1 proposing new proposalID 5 (Attempt 2)
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M1 sent message: PREPARE 5 M1
M7 sending PROMISE for proposal: 5 to proposer: M1
M5 sending PROMISE for proposal: 5 to proposer: M1
M8 sending PROMISE for proposal: 5 to proposer: M1
M4 sending PROMISE for proposal: 5 to proposer: M1
M8 sent message: PROMISE 5 M8
M4 sent message: PROMISE 5 M4
M6 sending PROMISE for proposal: 5 to proposer: M1
```

```
M9 sending PROMISE for proposal: 5 to proposer: M1
M7 sent message: PROMISE 5 M7
M5 sent message: PROMISE 5 M5
M1 recorded PROMISE from M8
M6 sent message: PROMISE 5 M6
M9 sent message: PROMISE 5 M9
M1 recorded PROMISE from M9
M1 recorded PROMISE from M4
M1 received majority PROMISES, broadcasting ACCEPT.
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 sent message: ACCEPT 5 M1
M1 recorded PROMISE from M5
M1 received majority PROMISES, broadcasting ACCEPT.
M8 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M4 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M5 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 5 M1
M7 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 5 M1
M8 sent message: ACCEPTED 5 M8
M6 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 5 M6
M7 sent message: ACCEPTED 5 M7
M6 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M6 sent message: ACCEPTED 5 M6
M9 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 5 M1
M9 sent message: ACCEPTED 5 M9
M4 sent message: ACCEPTED 5 M4
M5 sent message: ACCEPTED 5 M5
M1 sent message: ACCEPT 5 M1
M7 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M1 sent message: ACCEPT 5 M1
M7 sent message: ACCEPTED 5 M7
M1 sent message: ACCEPT 5 M1
M4 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M4 sent message: ACCEPTED 5 M4
M5 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M8 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M8 sent message: ACCEPTED 5 M8
M9 received ACCEPT for proposal: 5, sending ACCEPTED to proposer: M1
M5 sent message: ACCEPTED 5 M5
M4 acknowledged election winner is: 5
M1 sent message: FINALISE 5 M1
M9 sent message: ACCEPTED 5 M9
M1 sent message: FINALISE 5 M1
M1 sent message: FINALISE 5 M1
M5 acknowledged election winner is: 5
M1 sent message: FINALISE 5 M1
M6 acknowledged election winner is: 5
M1 sent message: FINALISE 5 M1
M8 acknowledged election winner is: 5
M7 acknowledged election winner is: 5
M9 acknowledged election winner is: 5
M1 sent message: FINALISE 5 M1

Election winner is M1
RELEASING PORTS
#################################
TEST 3.D COMPLETED
#################################
```